IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	**Confirmation No. 1924**
Shigeru FURUMIYA et al.	:	Atty Docket No. 2003-0615
Serial No. 10/615,799	:	Group Art Unit 2655
Filed July 10, 2003	:	Examiner Mohammad Edun
OPTICAL DISC AND OPTICAL DISC ADDRESS READING APPARATUS AND METHOD	:	

PATENT OFFICE FEE TRANSMITTAL FORM

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached hereto is a check in the amount of $130.00 to cover Patent Office fees relating to filing the following attached papers:

Petition $130.00

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The Commissioner is authorized to charge any deficiency or to credit any overpayment associated with this communication to Deposit Account No. 23-0975, with the EXCEPTION of deficiencies in fees for multiple dependent claims in new applications.

THE COMMISSIONER IS AUTHORIZED TO CHARGE ANY DEFICIENCY IN THE FEES FOR THIS PAPER TO DEPOSIT ACCOUNT NO. 23-0975

Respectfully submitted,

Shigeru FURUMIYA et al.

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2003_0615

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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OPTICAL DISC AND OPTICAL DISC ADDRESS READING APPARATUS AND METHOD

AMENDMENT, PETITION AND FEE DELETING CORRECTLY NAMED PEOPLE WHO ARE NOT INVENTORS OF INVENTION NOW BEING CLAIMED
(37 C.F.R. 1.48(b))

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This amendment and petition under 37 CFR 1.48(b) is submitted to delete the name of the following people named as inventors and who are not inventors of the invention now being claimed:

Takashi ISHIDA

Yoshiharu KOBAYASHI

The deletion of the above-named inventors reflects the correct inventorship of claims 39-40, which are the claims in this application due to the preliminary amendment filed on July 10, 2003. Thus, the above-named inventors inventions are no longer being claimed.

The requisite $130.00 fee as set forth in 37 CFR 1.17(h) accompanies this petition.

THE COMMISSIONER IS AUTHORIZED TO CHARGE ANY DEFICIENCY IN THE FEES FOR THIS PAPER TO DEPOSIT ACCOUNT NO. 23-0975

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Respectfully submitted,

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Title of Invention: OPTICAL DISC AND OPTICAL DISC ADDRESS READING APPARATUS AND METHOD

Shigeru FURUMIYA et al.

Co-pending Application No. 10/169,915

Attorney Docket No. 2002-0883A

Filed July 11, 2002

What is claimed is:

Claims 1-38 (Canceled)

39. A rewritable optical disc with a spiral or concentric track comprising:
a groove formed with a sinusoidal wobble along the track;
a sector block disposed along the track;
sectors formed by dividing each sector block into a plurality of parts;
a synchronization mark formed in the first sector in each sector block; and
positive marks or negative marks formed in sectors other than the first sector in each sector block;
each positive mark being a first groove discontinuity creating a discontinuity of a first width W1 in the track direction of the groove,
each negative mark being a second groove discontinuity creating a discontinuity of a second width W0 in the track direction of the groove, and
each synchronization mark being a third groove discontinuity creating a discontinuity of a third width Ws in the track direction.

40. An optical disc as described in claim 39, wherein the first, second, and third groove discontinuities have a mirror surface.

41. An optical disc as described in claim 39, wherein the first, second, and third groove discontinuities are formed in the maximum amplitude part of the wobble groove.

42. An optical disc as described in claim 39, wherein the first, second, and third groove discontinuities are formed in the minimum amplitude part of the wobble groove.

43. An optical disc as described in claim 39, wherein the first, second, and third widths W1, W0, and Ws are all longer than the longest mark contained in data recorded to a groove and less than or equal to 1/2 wobble period.

44. An optical disc as described in claim 39, wherein the first, second, and third widths W1, W0, and Ws are all longer than the longest mark contained in data recorded to a groove and less than or equal to 1/4 wobble period.

45. An optical disc as described in claim 39, wherein the ratio between first, second, and third widths W1, W0, and Ws is 1:2:4 where any one of widths W1, W0, and Ws is 1.

46. An optical disc as described in claim 39, wherein the ratio between first, second, and third widths W1, W0, and Ws is 2:1:4.

47. An optical disc as described in claim 39, wherein the first, second, and third widths W1, W0, and Ws are two bytes, one byte, and four bytes, respectively.

48. A rewritable optical disc with a spiral or concentric track comprising:

a groove formed with a sinusoidal wobble along the track;
a sector block disposed along the track;
sectors formed by dividing each sector block into a plurality of parts;
a synchronization mark formed in the first sector in each sector block; and
positive marks or negative marks formed in sectors other than the first sector in each sector block;
each positive mark, negative mark, and synchronization mark being formed as a groove top offset portion where the groove is locally offset in a first direction perpendicular to the track direction, a groove bottom offset portion where the groove is locally offset in a second direction perpendicular to the track direction, or a combination of groove bottom offset portions and groove top offset portions.

49. An optical disc as described in claim 48, wherein:
a positive mark is a groove top offset portion;
a negative mark is a groove bottom offset portion; and
a synchronization mark is a combination of a groove top offset portion and groove bottom offset portion.

50. An optical disc as described in claim 48, wherein the groove bottom offset portions and groove top offset portions are disposed at a maximum amplitude part of the wobble groove and are offset in a track center direction.

51. An optical disc as described in claim 48, wherein groove bottom offset portions and groove top offset portions of a synchronization mark are mutually adjacent at n+(½) wobble cycles (where n is a positive integer).

52. An optical disc as described in claim 51, wherein n is 0.

53. A rewritable optical disc with a spiral or concentric track comprising:
a groove formed with a sinusoidal wobble along the track;
a sector block disposed along the track;
sectors formed by dividing each sector block into a plurality of parts;
a synchronization mark formed in the first sector in each sector block; and
positive marks or negative marks formed in sectors other than the first sector in each sector block;
each positive mark, negative mark, and synchronization mark being formed by a groove ascending-phase inversion portion for vertically phase inverting an approximately 1/4 wobble cycle part from a trough in the wobble groove, a groove descending-phase inversion portion for vertically phase inverting an approximately 1/4 wobble cycle part from a peak in the wobble groove, or a combination of a groove ascending-phase inversion portion and groove descending-phase inversion portion.

54. An optical disc as described in claim 53, wherein a positive mark is formed by a groove ascending-phase inversion portion, a negative mark is formed by a groove descending-phase inversion portion, and a synchronization mark is formed by a combination of a

groove descending-phase inversion portion and groove ascending-phase inversion portion.

55. An optical disc as described in claim 53, wherein both ends of said groove descending-phase inversion portions and groove ascending-phase inversion portions are a groove discontinuity.

56. An optical disc as described in claim 53, wherein both ends of said groove descending-phase inversion portions and groove ascending-phase inversion portions are an abruptly displaced groove.

57. A rewritable optical disc with a spiral or concentric track, said disc having a wobbled groove formed along the track and being divided into sector blocks, wherein each of said sector blocks being divided into a plurality of sectors, characterized in that said wobbled groove containing positive marks in a specific plurality of sectors in each sector block; and negative marks formed in a different specific plurality of sectors in each sector block;

wherein a positive mark is indicated by a groove section, in which the wobbling of the groove - compared to a sinusoidal wobbling - contains a steeper outwardly inclination, and

a negative mark is indicated by a groove section, in which the wobbling of the groove - compared to a sinusoidal wobbling - contains a steeper inwardly inclination, and

wherein said positive and said negative marks being used for presenting sector block and address information.

58-60. (Canceled)

61. An address reading apparatus for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in claim 39 and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

an optical head for emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

a subtracter for getting a difference of signals from the two photodetectors and generating a difference signal;

a filter for removing a wobble frequency component of a wobbled track and generating a groove discontinuity pulse;

a discriminator for detecting a groove discontinuity pulse width and discriminating each synchronization mark, positive mark, and negative mark based on said width to generate a synchronization mark signal, positive mark signal, and negative mark signal; and

a demodulator for generating 1s and 0s according to each positive mark signal and negative mark signal contained between one synchronization mark signal and a next synchronization mark signal.

62. An address reading method for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in claim 39 and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

getting a difference of signals from the two photodetectors and generating a difference signal;

removing a wobble frequency component of a wobbled track and generating a groove discontinuity pulse;

detecting a groove discontinuity pulse width and discriminating each synchronization mark, positive mark, and negative mark based on said width to generate a synchronization mark signal, positive mark signal, and negative mark signal; and

generating 1s and 0s according to each positive mark signal and negative mark signal contained between one synchronization mark signal and a next synchronization mark signal.

63. An address reading apparatus for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in claim 48 and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

an optical head for emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

a subtracter for getting a difference of signals from the two photodetectors and generating a difference signal;

a filter for removing a wobble frequency component of a wobbled track and generating a groove bottom offset portion pulse in a negative direction and a groove top offset portion pulse in a positive direction;

discriminators for discriminating each synchronization mark, positive mark, and negative mark based on said groove top offset portion pulse, groove bottom offset portion pulse, and groove bottom offset portion pulse and groove top offset portion pulse pair to generate a positive mark signal, negative mark signal, and synchronization mark signal; and

a demodulator for generating 1s and 0s according to each positive mark signal and negative mark signal contained between one synchronization mark signal and a next synchronization mark signal.

64. An address reading method for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in claim 48 and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

getting a difference of signals from the two photodetectors and generating a difference signal;

removing a wobble frequency component of a wobbled track and generating a groove bottom offset portion pulse in a negative direction and a groove top offset portion pulse in a positive direction;

discriminating each synchronization mark, positive mark, and negative mark based on said groove top offset portion pulse, groove bottom offset portion pulse, and groove bottom offset portion pulse and groove top offset portion pulse pair to generate a positive mark signal,

negative mark signal, and synchronization mark signal; and

generating 1s and 0s according to each positive mark signal and negative mark signal contained between one synchronization mark signal and a next synchronization mark signal.

65. An address reading apparatus for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in claim 53 and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

an optical head for emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

a subtracter for getting a difference of signals from the two photodetectors and generating a difference signal;

a filter for removing a wobble frequency component of a wobbled track and generating a groove descending-phase inversion portion pulse in a negative direction and a groove ascending-phase inversion portion pulse in a positive direction;

discriminators for discriminating each synchronization mark, positive mark, and negative mark based on said groove ascending-phase inversion portion pulse, groove descending-phase inversion portion pulse, and groove descending-phase inversion portion pulse and groove ascending-phase inversion portion pulse pair to generate a positive mark signal, negative mark signal, and synchronization mark signal; and

a demodulator for generating 1s and 0s according to each positive mark signal and negative mark signal contained between one synchronization mark signal and a next synchronization mark signal.

66. An address reading method for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in claim 53 and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

getting a difference of signals from the two photodetectors and generating a difference signal;

removing a wobble frequency component of a wobbled track and generating a groove descending-phase inversion portion pulse in a negative direction and a groove ascending-phase inversion portion pulse in a positive direction;

discriminating each synchronization mark, positive mark, and negative mark based on said groove ascending-phase inversion portion pulse, groove descending-phase inversion portion pulse, and groove descending-phase inversion portion pulse and groove ascending-phase inversion portion pulse pair to generate a positive mark signal, negative mark signal, and synchronization mark signal; and

generating 1s and 0s according to each positive mark signal and negative mark signal contained between one synchronization mark signal and a next synchronization mark signal.

67. An address reading apparatus for detecting positive marks and negative marks contained in an optical disc as described in claim 57 and accumulating 1 and 0 data obtained

from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

an optical head for emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

a subtracter for getting a difference of signals from the two photodetectors and generating a difference signal;

a filter for removing a wobble frequency component of a wobbled track and generating a positive pulse corresponding to said first portion and a negative pulse corresponding to said second portion;

discriminators for discriminating each positive mark and negative mark based on said positive and negative pulses to generate a positive mark signal and negative mark signal; and

a demodulator for generating 1s and 0s according to each positive mark signal and negative mark signal contained in one sector block.

68. An address reading method for detecting positive marks and negative marks contained in an optical disc as described in claim 57 and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

getting a difference of signals from the two photodetectors and generating a difference signal;

removing a wobble frequency component of the wobbled track and generating a positive pulse corresponding to said first portion and a negative pulse corresponding to said second portion;

discriminating each positive mark and negative mark based on said positive and negative pulses to generate a positive mark signal and negative mark signal; and

generating 1s and 0s according to each positive mark signal and negative mark signal contained in one sector block.

69. An address reading apparatus for detecting positive marks and negative marks contained in an optical disc as described in claim 59 and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

an optical head for emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

a subtracter for getting a difference of signals from the two photodetectors and generating a difference signal;

a filter for removing a wobble frequency component of a wobbled track and generating a positive pulse corresponding to said first portion and a negative pulse corresponding to said second portion;

a first counter for counting a number of negative pulses contained in one sector;

a second counter for counting a number of positive pulses contained in one sector;

discriminators for comparing a first count from the first counter and a second count from the second counter and discriminating each positive mark and negative mark according to

whether the first count is sufficiently high or the second count is sufficiently high to generate a positive mark signal and negative mark signal; and

a demodulator for generating 1s and 0s according to each positive mark signal and negative mark signal contained in one sector.

70. An address reading method for detecting positive marks and negative marks contained in an optical disc as described in claim 59 and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

getting a difference of signals from the two photodetectors and generating a difference signal;

removing a wobble frequency component of a wobbled track and generating a positive pulse corresponding to said first portion and a negative pulse corresponding to said second portion;

counting a number of negative pulses contained in one sector as a first count;

counting a number of positive pulses contained in one sector as a second count;

comparing the first count and second count and discriminating each positive mark and negative mark according to whether the first count is sufficiently high or the second count is sufficiently high to generate a positive mark signal and negative mark signal; and

generating 1s and 0s according to each positive mark signal and negative mark signal contained in one sector.

71. An optical disc as described in claim 57, further comprising a block mark indicating a leading end position of the sector block.

72. An optical disc as claimed in claim 71, wherein said block mark is formed as a discontinuity in the track groove.

73. An optical disc as described in claim 71, wherein said block mark is formed as a local change in track groove width.

74. An optical disc as described in claim 71, wherein said block mark is formed as a local change in wobble amplitude.

75. An optical disc as described in claim 57, wherein each wobble cycle is formed so that the duty ratio differs in positive marks and negative marks.

76. An optical disc as described in claim 57, wherein only one edge of the track groove is wobbled.

77-79. (Canceled)

Title of Invention: OPTICAL DISC AND OPTICAL DISC ADDRESS READING APPARATUS AND METHOD

Shigeru FURUMIYA et al.

Co-pending Application No. 10/445,796

Attorney Docket No. 2003-0613

Filed May 28, 2003

What is claimed is:

Claims 1-38 (Canceled)

39. An optical disc with a spiral or concentric track,

said disc having a wobbled groove formed along the track and being divided into sector blocks, wherein each of said sector blocks is divided into a plurality of sectors,

said wobbled groove containing positive marks in a specific plurality of sectors in each sector block; and negative marks formed in a different specific plurality of sectors in each sector block, said positive and said negative marks being used for presenting address information of sector block, and

wherein each of said positive and negative marks is formed by repetition for a plurality of cycles of the wobbled groove.

40. An optical disc as claimed in claim 39, wherein said positive mark is indicated by a groove section, in which the wobbling of the groove - compared to a sinusoidal wobbling - contains a steeper outward inclination, and said negative mark is indicated by a groove section, in which the wobbling of the groove - compared to a sinusoidal wobbling - contains a steeper inward inclination.

Title of Invention: OPTICAL DISC AND OPTICAL DISC ADDRESS READING APPARATUS AND METHOD

Shigeru FURUMIYA et al.

Co-pending Application No. 10/446,018

Attorney Docket No. 2003-0614

Filed May 28, 2003

What is claimed is:

Claims 1-38 (Cancelled).

Claim 39. An optical disc with a spiral or concentric track,

said disc having a wobbled groove formed along the track and being divided into sector blocks, wherein each of said sector blocks is divided into a plurality of sectors,

said wobbled groove containing positive marks formed in a specific plurality of sectors in each sector block;

wherein a positive mark is indicated by a groove section, in which the wobbling of the groove - compared to a sinusoidal wobbling - contains a steeper outward inclination, and

wherein said positive marks are used for presenting address information of sector block.

Claim 40. An optical disc with a spiral or concentric track,

said disc having a wobbled groove formed along the track and being divided into sector blocks, wherein each of said sector blocks is divided into a plurality of sectors,

said wobbled groove containing negative marks formed in a specific plurality of sectors in each sector block;

wherein a negative mark is indicated by a groove section, in which the wobbling of the groove - compared to a sinusoidal wobbling - contains a steeper inward inclination, and

wherein said negative marks are used for presenting address information of sector block.

Title of Invention: OPTICAL DISC AND OPTICAL DISC ADDRESS READING APPARATUS AND METHOD

Shigeru FURUMIYA et al.

Co-pending Application No. 10/807,354

Attorney Docket No. 2004-0450

Filed March 24, 2004

What is claimed is:

1-38. (Cancelled)

39. An information carrier having a wobbled groove formed along a track,

wherein said wobbled groove is modulated with an information signal in such a way that said wobbled groove contains positive marks and negative marks, and

wherein one or more of said positive marks are used for indicating a logical "1" or "0" and one or more of said negative marks are used for indicating a logical "0" or "1", respectively.

40. An information carrier according to claim 39, wherein a wobble of said wobbled groove, compared to a sinusoidal wobble, contains a steeper outwardly inclination at positive marks, and a steeper inwardly inclination at negative marks.

41. An information carrier according to claim 40, wherein a logical "1" or "0" is indicated by a plurality of said positive marks, and a logical "0" or "1" is indicated by a plurality of said negative marks, respectively.

42. An information carrier according to claim 39, wherein a logical "1" or "0" is indicated by a plurality of said positive marks, and a logical "0" or "1" is indicated by a plurality of said negative marks, respectively.

43. An information carrier according to claim 39, wherein said wobbled groove contains a combination of said positive marks and said negative marks for indicating an address signal.

44. An information carrier according to claim 39, wherein said wobbled groove contains a combination of at least one of said positive marks and at least one of said negative marks for indicating a synchronization signal.

45. A reproducing apparatus for reproducing an information signal from an information carrier having a wobbled groove formed along a track, wherein the wobbled groove is modulated with an information signal in such a way that the wobbled groove contains positive marks and negative marks, and wherein one or more of the positive marks are used for indicating a logical "1"or " 0" and one or more of the negative marks are used for indicating a logical "0" or " 1", respectively, said reproducing apparatus comprising:

a pickup unit operable to read a signal recorded on the information carrier;

a detector operable to detect at least one of the positive marks and at least one of the negative marks from the read signal;

a generator operable to generate 1s and 0s according to at least one positive mark signal and at least one negative mark signal; and

a converter operable to convert the 1s and 0s produced from said generator to an address signal.

46. A reproducing apparatus according to claim 45, wherein a logical "1" is represented by positive marks and a logical "0" is represented by negative marks.

47. A reproducing apparatus according to claim 46, wherein said detector comprises a high pass filter operable to detect a steeper inclination, and a comparator operable to compare a signal output from said high pass filter with a predetermined level.

48. A reproducing apparatus according to claim 46, wherein said generator generates 1s and 0s according to a plurality of positive mark signals and a plurality of negative mark signals.

49. A reproducing apparatus according to claim 48, wherein said detector comprises a high pass filter operable to detect a steeper inclination, and a comparator operable to compare a signal output from said high pass filter with a predetermined level.

50. A reproducing apparatus according to claim 45, wherein said generator generates 1s and 0s according to a plurality of positive mark signals and a plurality of negative mark signals.

51. A reproducing apparatus according to claim 50, wherein said detector comprises a high pass filter operable to detect a steeper inclination, and a comparator operable to compare a signal output from said high pass filter with a predetermined level.

52. A reproducing apparatus according to claim 45, wherein said detector comprises a high pass filter operable to detect a steeper inclination, and a comparator operable to compare a signal output from said high pass filter with a predetermined level.

Title of Invention: OPTICAL DISC AND OPTICAL DISC ADDRESS READING APPARATUS AND METHOD

Shigeru FURUMIYA et al.

Co-pending Application No. 10/807,389

Attorney Docket No. 2004-0449

Filed March 24, 2004

What is claimed is:

1-38. (cancelled)

39. A reproducing apparatus for reproducing an information signal from an information carrier having a wobbled groove formed along a track, wherein the wobbled groove is modulated with an information signal in such a way that the wobbled groove contains positive marks and negative marks, and wherein one or more of the positive marks are used for indicating a logical "1" or "0" and one or more of the negative marks are used for indicating a logical "0" or "1", respectively, said reproducing apparatus comprising:

an input terminal operable to receive a signal read from the information carrier;

a detector operable to detect positive marks and negative marks from the signal;

a generator operable to generate 1s and 0s according to positive mark signals and negative mark signals; and

a converter operable to convert said 1s and 0s produced from said generator to an address signal.

40. A reproducing apparatus according to claim 39, wherein a logical "1" is represented by positive marks and a logical "0" is represented by negative marks.

41. A reproducing apparatus according to claim 40, wherein said detector comprises a high pass filter operable to detect a steeper inclination, and a comparator operable to compare a signal output from said high pass filter with a predetermined level.

42. A reproducing apparatus according to claim 40, wherein said generator generates 1s and 0s according to a plurality of positive mark signals and a plurality of negative mark signals.

43. A reproducing apparatus according to claim 42, wherein said detector comprises a high pass filter operable to detect a steeper inclination, and a comparator operable to compare a signal output from said high pass filter with a predetermined level.

44. A reproducing apparatus according to claim 39, wherein said generator generates 1s and 0s according to a plurality of positive mark signals and a plurality of negative mark signals.

45. A reproducing apparatus according to claim 44, wherein said detector comprises a high pass filter operable to detect a steeper inclination, and a comparator operable to compare a signal output from said high pass filter with a predetermined level.

46. A reproducing apparatus according to claim 39, wherein said detector comprises a high pass filter operable to detect a steeper inclination, and a comparator operable to compare a signal output from said high pass filter with a predetermined level.